

REMARKS/ARGUMENTS

Claims 2-19 and 21-23 are pending in this application. Claims 2 and 16 are currently amended. Claims 21-23 are allowed. Claims 24-41 are new. In view of the following amendments and remarks, Applicants respectfully request reconsideration of the application.

I. Rejection Under 35 U.S.C. § 102(b)

A. Claims 2-5

Claims 2-5 were rejected under 35 U.S.C. § 102(b) as being unpatentable over European Pat. App. No. 0964608 A2 to Meyer et al. ("Meyer"). Applicants respectfully traverse.

The Examiner claims that Meyer teaches a soldering method including providing two circuits with at least one trace each, placing solder on at least one of the circuits, placing the two circuits in alignment, and using a laser beam to melt and fuse the solder. The Examiner claims that Meyer teaches that "redirecting" the beam means that the beam is moving across the circuit.

Claim 2 has been amended to add the limitation that the contact traces be laminated to the flex circuits rather than embedded therein. Support for this amendment is found at least at page 4, lines 19-20. No new matter has been added by this amendment

In her reasons for allowance of claims 21-23, the Examiner states that nothing in the prior art teaches or suggests laminating contact traces onto each

of the plastic substrates. Claim 2 as amended contains the limitation that the contact traces be laminated to the flex circuits. Meyer does not teach or suggest the step of laminating the contact traces to the flex substrates, nor would it be obvious to one skilled in the art to change the attachment method completely to utilize lamination. For at least the reasons above, the rejection of claim 2 under §102(b) should be withdrawn.

Claims 3-5 are dependent on amended claim 2, which is believed to be allowable, therefore, claims 3-5 are also believed to be allowable and the rejection under §102(b) should be withdrawn.

II. Rejection Under 35 U.S.C. § 103(a)

A. Claims 6-15

Claims 6-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Meyer as applied to claims 2-5, and further in view of U.S. Pat. No. 6,333,483 to Ueno ("Ueno"). Applicants respectfully traverse.

The Examiner claims that Meyer teaches the method as described but is silent as to laser beam shape, while Ueno teaches reflowing solder cream with a laser, which desirably has a shape that matches that of the pad as closely as possible. The Examiner claims that, according to the teaching of Ueno, a rectangular laser would be desirable if the pad is rectangular.

With respect to claim 7, the Examiner claims that Meyer teaches that the substrate should allow as much as 95% or more of the laser energy to pass

through. With respect to claims 8 and 9, the Examiner claims that Meyer teaches that the solder paste may be deposited through a conventional means, including the use of a stencil to print the paste. Additionally, with respect to claim 9, the Examiner claims that stenciling conventionally works to apply a solder mask that does not cover the areas to be joined, i.e. the solder paste is deposited in an area not covered by a mask.

With respect to claims 10-12, the Examiner claims that Meyer teaches that the laser energy is directed to the mounting pads to melt the solder paste and join the pads with a solid solder joint. With respect to claims 13-15, the Examiner claims that Meyer teaches that several laser beams may be used simultaneously and that these beams need not all be perpendicular to the surface.

As previously argued, Meyer does not teach each and every limitation of amended claim 2. Claims 6-15 are dependent on amended claim 2, which is believed to be allowable. As claims 6-15 incorporate each and every limitation of amended claim 2, they are believed to be allowable as well. Therefore, the §103(a) rejection of claims 6-15 should be withdrawn.

B. Claims 16-18

Claims 16-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Meyer in view of U.S. Pat. No. 5,021,630 to Benko ("Benko"). The Examiner claims that Meyer teaches a soldering method including providing two circuits with at least one trace each, placing solder on at least one of the

circuits, placing the two circuits in alignment, and using a laser beam to melt and fuse the solder. The Examiner claims that Meyer teaches that the laser beam is "redirected" which would mean that the beam is moving across the circuit, but does not specifically teach moving the beam during solder reflow. The Examiner claims that Benko teaches laser soldering where a laser is directed across a row of bond pads to join leads to the bond pads, and claims that it would be obvious to modify Meyer by moving the laser beam across areas to be joined by solder because Benko demonstrates an art-recognized method to laser solder multiple joints efficiently. Applicants respectfully traverse.

Claim 16 has been amended to include the limitation that the contact traces be laminated to the flex substrates. Support for this amendments is found at least at page 4, lines 19-20. No new matter has been added by this amendment.

In her reasons for allowance of claims 21-23, the Examiner states that nothing in the prior art teaches or suggests laminating contact traces onto each of the plastic substrates. Claim 16 as amended contains the limitation that the contact traces be laminated to the flex circuits. Meyer does not teach or suggest the step of laminating the contact traces to the flex substrates, nor would it be obvious to one skilled in the art to change the attachment method completely to utilize lamination. For at least the reasons above, the rejection of claim 16 under §103(a) should be withdrawn.

With respect to claims 17 and 18, these claims are dependent on claim 16, which is believed to be allowable as amended. Since claims 17 and 18 incorporate each and every limitation of claim 16 as amended, they are believed to be allowable as well and the §103(a) rejection should be withdrawn.

III. New Claims 24-38

Claims 24 and 38 have been added as independent claims. These claims contain the limitation that the contact traces be laminated to the flex circuits rather than embedded therein and that the laser beam moves at a constant speed across the flex circuits. In her response to Applicants arguments in the amendment file 7/29/03, the Examiner states that Applicants' argument that the beam moves during application of the beam energy to the contact traces was not recited in the rejected claims. Claims 24 and 38 require that the laser beam move at a constant speed across the flex circuits. Support for the limitations of these new claims is found at least at page 4, lines 19-20 and page 6, lines 7-8. No new matter has been added by these new claims.

Meyer teaches that the laser beam is applied to a mounting pad and after the solder paste is melted, it is turned off and/or redirected to another solder pad. Redirection of the laser beam implies that the direction of the laser beam is changed. In other words, the laser beam itself remains stationary and is *turned* to apply beam energy to the next trace. This does not encompass constantly moving the laser beam itself across the contact trace. As previously argued, this

teaches away from continuously moving the laser beam across the flex circuit, as claimed in new claims 24 and 38 of the present application. It would not be obvious to make such an adjustment, as doing so would necessitate changing the laser beam aiming apparatus such that the entire laser moved rather than just turning the beam. Furthermore, claims 24 and 38 contain the limitation that the contact traces be laminated to the flex substrates. As previously argued, nothing in Meyer or any of the other cited art teaches, suggests or makes it obvious to modify the prior art to use lamination. Therefore, claims 24 and 38 are believed to be allowable.

Claims 25-37 are dependent upon new claim 24, which is believed to be allowable. Since claims 25-37 incorporate each and every limitation of new claim 24, which is believed to be allowable, claims 25-37 are also believed to be allowable. Claims 38-41 are dependent upon new claim 37, which is believed to be allowable. Since claims 38-41 incorporate each and every limitation of new claim 24, which is believed to be allowable, claims 38-41 are also believed to be allowable.

III. Allowed Claims

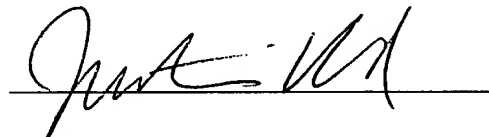
Claims 21-23 have been allowed. Applicants appreciate the Examiner's allowance of these claims.

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Amdt. dated December 2, 2003
Reply to Office action of October 2, 2003

IV. Conclusion

In conclusion, Applicants have overcome each of the rejections. The application is therefore in condition for allowance. If, for any reason, the Examiner believes that the amendments and remarks do not put the claims in condition for allowance, the undersigned attorney can be reached at (312) 245-5394 to resolve any remaining issues.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Justin B. Rand", is written over a horizontal line.

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